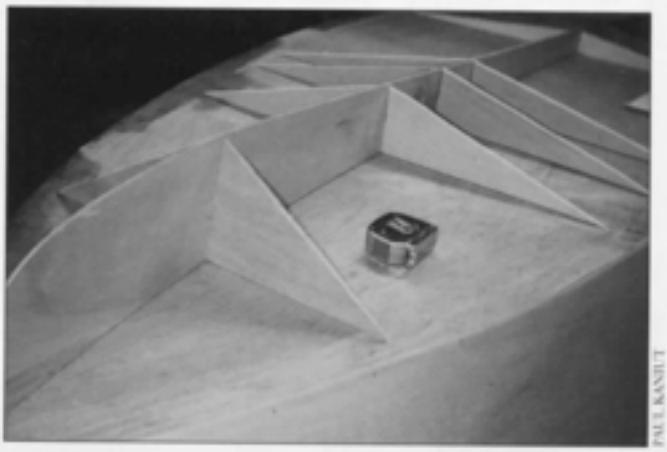
Flatform Hull Construction

Building a V-bottom on a flat bottom

by Paul Kaniut

I wanted to build a light, strong outboard skiff. Some fiberglass runabouts, with chine-flats that act as spray rails and lift strakes, appealed to me; but I wasn't attracted by the boats' great weights and high prices. Stitch-and-glue, plywood-epoxy construction seemed to offer light weight and reasonable cost—but how could I duplicate those chines without a lot of framing and fitting?

While doodling with some sketches, an idea came to me. If I were to build a flat-bottomed hull, this would produce a flat sole for the interior. The deadrise bottom could be obtained later by building a V-shaped appendage over the flat bottom of the inverted hull. If that appendage were set a few inches inboard of the chines, a horizontal "flat" would develop at the chine to form the spray rail/lifting strakes. The drawing and photos show the results.



PAUL KANIUT

The QE prototype under construction: First build a flat-bottomed skiff, then add the V-bottom. Here the frame for the V-bottom rests partially assembled atop the inverted flat-bottomed skiff.

Assembly

With the "Flatform" construction method, we use the hull's flat "bottom" instead of a ladder frame to keep the structure true. The boats go together quickly and easily—hence the "QE" designation on my plans. Much of the simple stitch-and-glue assembly process is familiar to anyone who has put together a kayak kit. [Readers with boat-design backgrounds can adapt the flatform method to their own plans; others may use the author's stock designs.]

First, support the flat "bottom" on sawhorses. Drill ⅛" holes every 6" about ⅜" in from the edges of that panel. Drill matching holes along the lower edges of the topside panels. Connect the topside panels to each other at the stem using 6"-lengths of wire pushed through the holes and loosely twisted.

Place the bottom panel on the shop floor, lay the side assembly in place over it, and prop up the bow so that it is 9" above the floor. This will force the proper amount of flare into the sides. Stitch the sides loosely to the bottom and then the transom to the bottom and sides. Starting at the transom, twist all the wires to tighten the joints and hold the panels firmly in place.

Install temporary cross-spalls to hold the hull's shape. Apply thickened-epoxy and fiberglass-tape fillets to the inside of all seams. Tape the bulkheads and seats into

The author built this model to check his Flatform concept in three-dimensions. Although he modified the hull's interior as the full-sized boat developed, the bottom structure survived unchanged.

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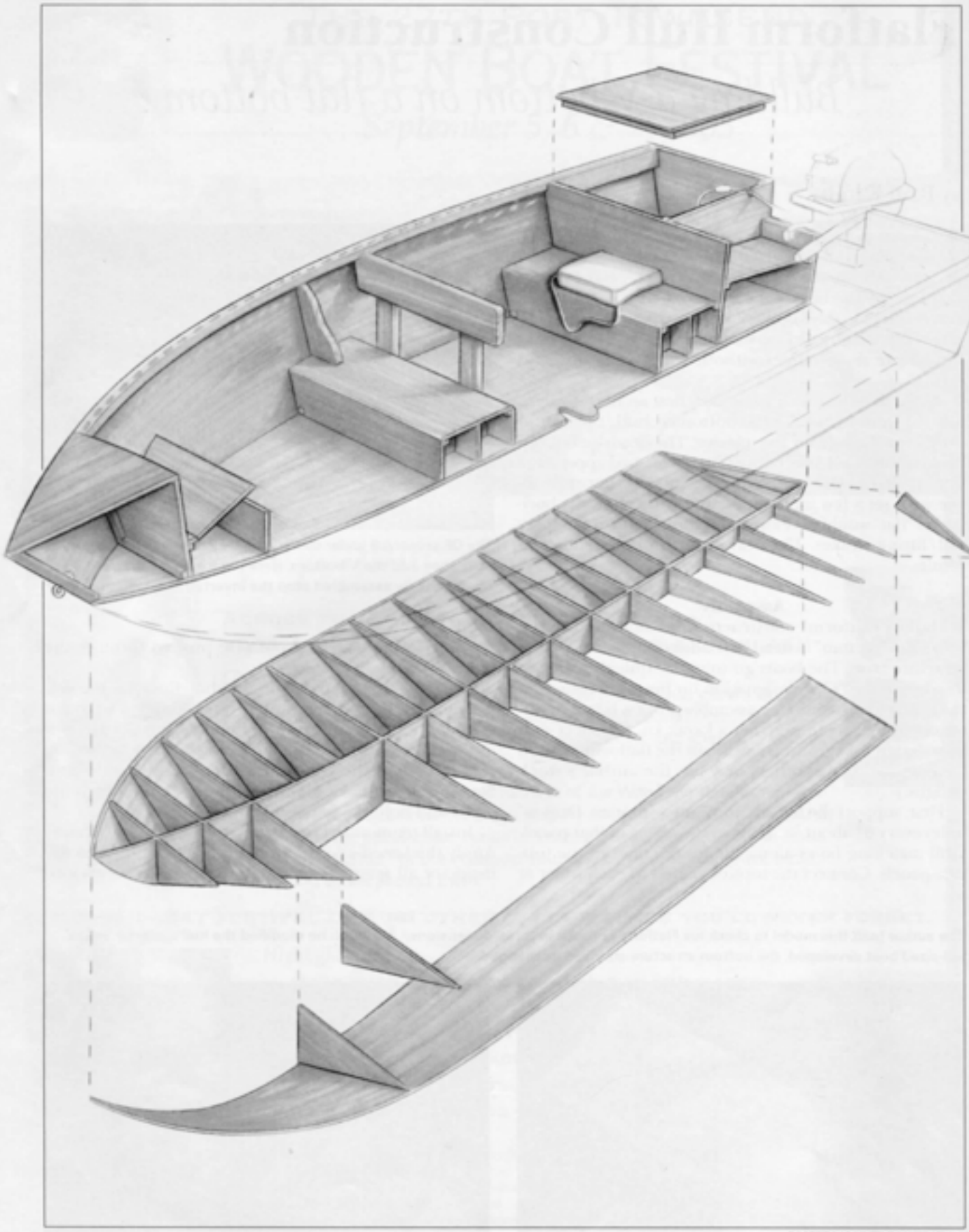
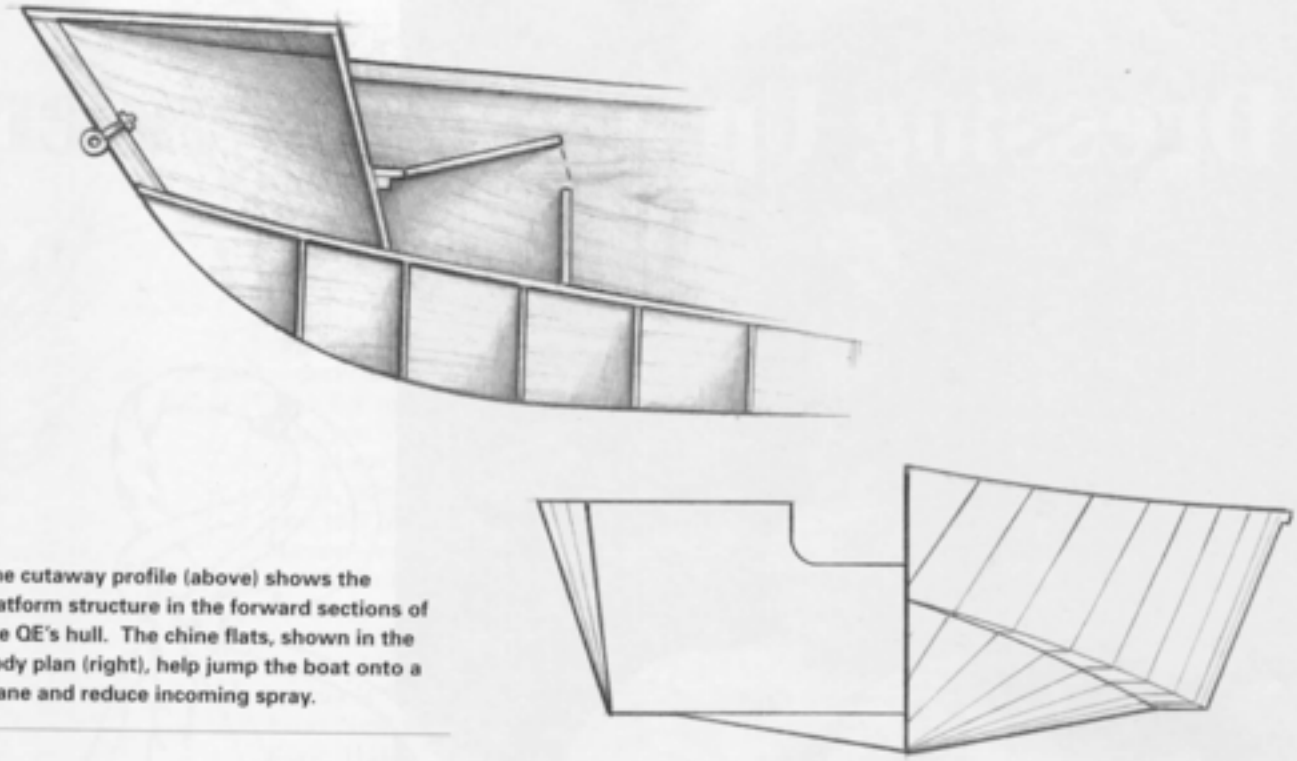


ROBERT LAPOINTE ILLUSTRATIONS

This "exploded" illustration indicates how a Flatform hull goes together. The construction technique results in clear, flat footing for the crew and a sophisticated hull-bottom shape that performs well.



The cutaway profile (above) shows the Flatform structure in the forward sections of the QE's hull. The chine flats, shown in the body plan (right), help jump the boat onto a plane and reduce incoming spray.

position. Install the gunwales. After the epoxy has cured, invert the hull. Round-over the chines, and cover them with 'glass tape and epoxy.

Draw a line on the flat bottom where the V-bottom panels will land, as shown on the plans. Wire together the two halves of the V-bottom appendage, and then open them as you would a book.

Attach the ¼" keel to the centerline of the flat bottom. Glue the frames that will support the V-bottom to the flat bottom. After dry-fitting the V-bottom to the flat bottom, turn the V-bottom assembly over, and liberally coat its interior with epoxy.

Glue the V-bottom permanently into position. Drywall screws will hold it until the epoxy cures. After sheathing the entire bottom with epoxy and fiberglass, turn the hull right-side up, and finish it as you would a conventionally built boat.

Results

I expected the boat to gain weight with the double bottom, but the 12- footer tips the scale at only 136 lbs. The 16′ prototype, which was deliberately built light so as to highlight areas needing more beef, weighs approximately 230 lbs. Built with the heavier materials I now recommend, its weight can be expected to increase slightly. I built the 16-footer in about 80 hours, not counting time required for the epoxy to cure.

The 12′ boat rows easily, and a 15-hp outboard will push it onto a plane with a crew of two aboard. The same engine will push the 16-footer to slightly more than 25 mph with one person in the boat. Handling at speed is predictable. I weigh 230 lbs and can stand just about anywhere in the 16′ boat without its feeling unstable. The bottom shape works as I had hoped. The V-section forward softens the ride in a chop, and the chine-flats deflect spray. They also add stability.

I don't know if this construction method is completely original. The idea seems so obvious I can't believe no one else has tried it.

Paul Kaniut built his first boat, a plywood dingley, at the age of 14. Since then, he has designed automobiles, airplanes, and more boats. Now a semiretired writer and management consultant, he has time to trailer his boats wherever "the spirit might move on a warm summer day."

Plans for the QE 12, 16, and 18 are available from Kaniut Designs, 1365 Autumn Ln., Rochester Hills, MI 48306.

The prototype QE proved lighter than expected, planes readily, and banks predictably into turns.

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